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FLOOD INSURANCE STUDY

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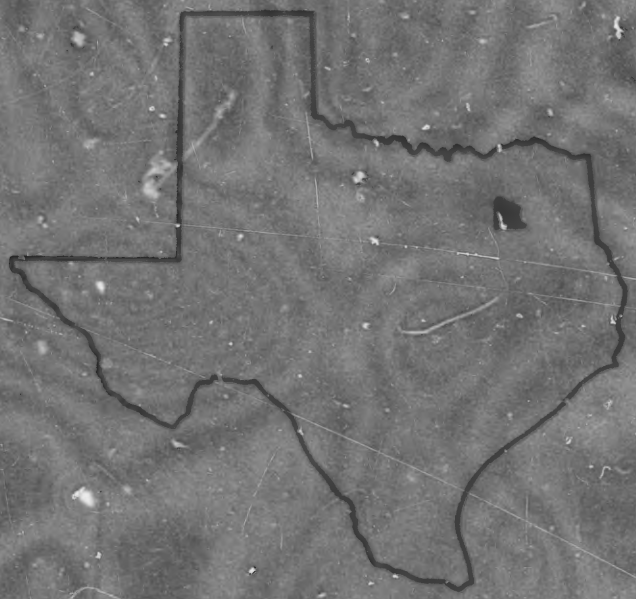

CITY OF CANTON, TEXAS
VAN ZANDT COUNTY

SEPTEMBER 29, 1986

Federal Emergency Management Agency

COMMUNITY NUMBER - 480632

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Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

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FLOOD INSURANCE STUDY
CITY OF CANTON, TEXAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the City of Canton, Van Zandt County, Texas, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in their efforts to promote sound flood plain management. Minimum flood plain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the Fort Worth District of the U. S. Army Corps of Engineers (COE) for the Federal Emergency Management Agency (FEMA) under Inter-Agency Agreement No. EMW-E-1153, Project Order No. 1, Amendment No. 4. This study was completed in December 1984.

1.3 Coordination

On March 31, 1983, an initial Consultation and Coordination Officer's (CCO) meeting, combined with a time and cost meeting, was attended by representatives of the City of Canton, the COE (the study contractor), and FEMA. At this meeting, streams to be studied by detailed and approximate methods were identified.

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Information concerning flooding in the City of Canton was requested from the Soil Conservation Service (SCS), the U. S. Geological Survey (USGS), the Texas Department of Water Resources, the Texas Department of Public Safety, Dewberry and Davis, and Greenhorne & O'Mara, Inc.

On November 5, 1985, the results of the study were reviewed at the final CCO meeting attended by representatives of the city, FEMA, and the study contractor.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Canton, Van Zandt County, Texas. The area of study is shown on the Vicinity Map (Figure 1).

The following streams were studied by detailed methods for their entire stream lengths within the community: Mill Creek, Dry Creek, Stream DC-1, Stream DC-2, Stream DC-2A, Stream DC-3, and Stream DC-3A. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through December 1989.

Lake Canton and several unnamed tributaries were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the City of Canton.

2.2 Community Description

The City of Canton is located in northeast Texas in the central portion of Van Zandt County. It is situated approximately 60 miles east of downtown Dallas, Texas. The land area contained within the corporate limits is approximately 2.8 square miles. The City of Canton is completely enclosed by the unincorporated areas of Van Zandt County. The population of Canton was 2,845 in 1980 (References 1 and 2).

Mill Creek flows north through the eastern part of the city into the Sabine River. Mill Creek is approximately 10 miles long from its headwaters to the confluence of Caney Creek and has a drainage area of approximately 22 square miles at the confluence of Caney Creek.

Dry Creek flows through the center of the city for approximately 2.5 miles. This stream has a drainage area of approximately 7.6 square

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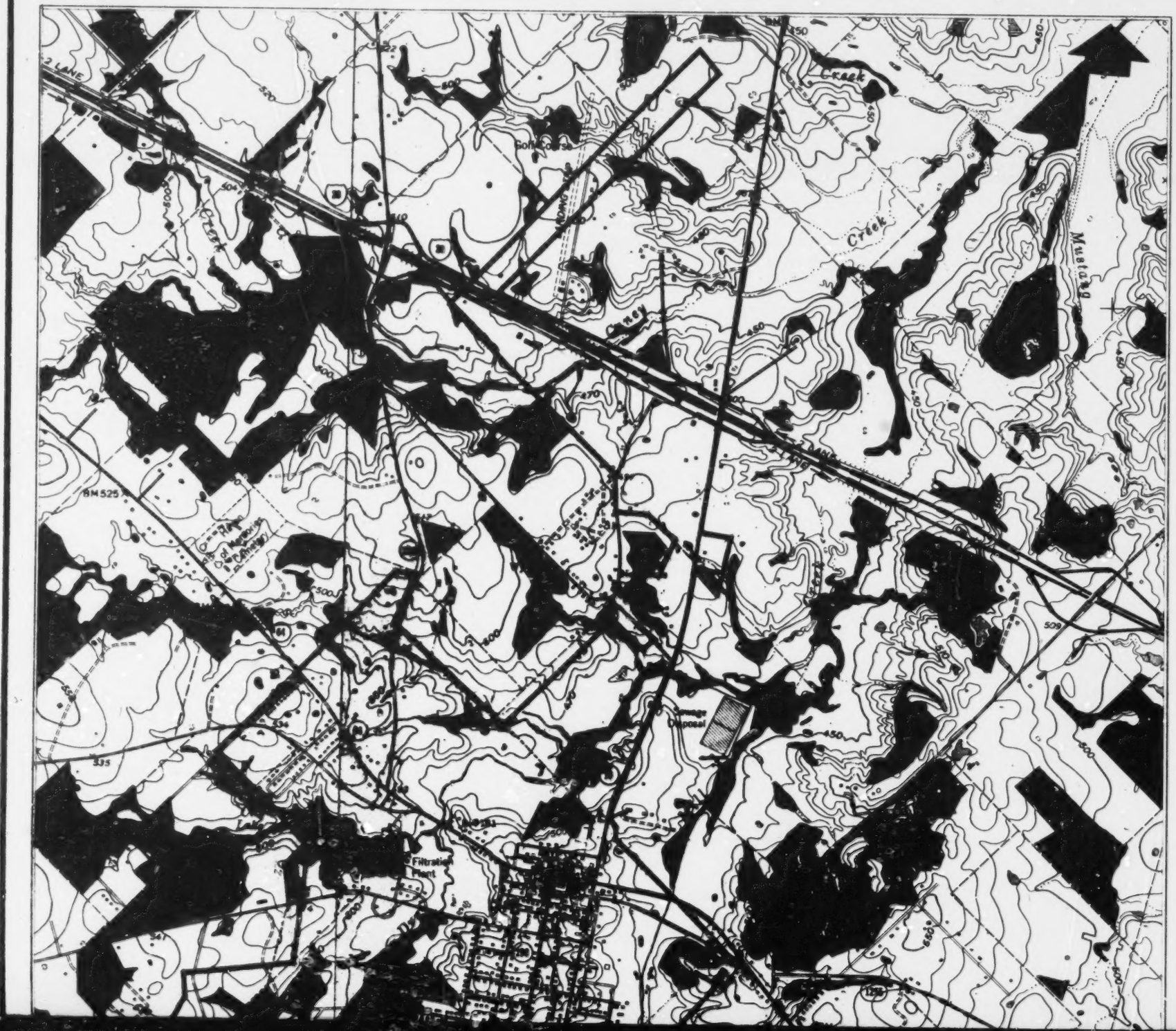
Creek
Mustang
Creek
Filtration Plant
Sewage Disposal
BM525

3

3A

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

[redacted]

APPROXIMATE SCALE

VICINITY MAP

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miles; however, near the eastern corporate limits, it has a drainage area of approximately 5.5 square miles.

Stream DC-1 flows from west to east into Dry Creek. This stream is approximately 2.9 miles long and has a drainage area of approximately 1.4 square miles.

Stream DC-2 flows from west to east into Dry Creek. This stream is approximately 1.8 miles long and has a drainage area of approximately 1.1 square miles.

Stream DC-2A flows from northwest to southeast into Stream DC-2. This stream is approximately 0.5 mile long with a drainage area of approximately 0.2 square mile.

Stream DC-3, with a drainage area of approximately 0.5 square mile, flows west to east into Dry Creek. This stream is approximately 2.1 miles long.

Stream DC-3A flows from south to north into Stream DC-3. This stream is approximately 1.5 miles long and has a drainage area of approximately 0.5 square mile.

The climatological data at Dallas Love Airport are considered indicative of the conditions prevailing in the region. Average rainfall was 35.04 inches for the period from 1934 to 1981. The maximum and minimum annual rainfall occurring during the last 47 years was 54.74 inches in 1962 and 17.52 inches in 1963, respectively. Observed temperature extremes were 107 degrees Fahrenheit (°F) in August 1964 and 8 (°F) in January 1963 (Reference 3).

2.3 Principal Flood Problems

Generally, the major floods experienced in the vicinity are produced by heavy rainfall from frontal type storms which occur in the spring and summer months. Major flooding can be produced by the intense rainfall usually associated with localized thunderstorms. These thunderstorms may occur at any time during the year, but they are more prevalent during the spring and summer months.

Floods occurred on Dry Creek in June 1977 and May 1979. Damages were recorded between State Route 64 and State Route 198 during these floods.

2.4 Flood Protection Measures

Nonstructural measures of flood protection in the form of land use regulations are being used to aid in the prevention of future flood

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damages. During storms, Lake Canton Dam reduces the amount of flow on Mill Creek in the city; also, the discharge of Stream DC-2 is reduced during storms by City Lake Dam.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The computer program NUDALLAS was used in developing the hydrology for the streams studied by detailed methods (Reference 4). The watershed was divided into subareas, and synthetic unit and flood hydrographs were developed at selected locations. Weather Bureau Technical Paper No. 40 and National Oceanic and Atmospheric Administration Technical Memorandum NWS Hydro-35 were used in developing the 10-, 50-, and 100-year frequency storms (References 5 and 6). The 500-year storm was based on extrapolated data. Peak discharge-frequency values were computed for selected locations. Routing of the flood hydrographs through each sub-basin reach was accomplished using a modified Puls reservoir routing method. The HEC-2 backwater model provided the elevation-discharge-storage relationships for each reach (Reference 7).

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A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges." Discharges on portions of Mill Creek, Dry Creek, and Stream DC-1 have been decreased due to storage routing. The discharge of Stream DC-2 at its confluence with Dry Creek has been decreased due to the effect of City Lake Dam.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
MILL CREEK					
At Interstate Route 20	21.74	5,750	8,700	10,150	13,000
Below the confluence with Dry creek	20.82	5,700	8,600	9,900	12,550
Above the confluence of Dry Creek	13.25	1,750	2,450	2,850	3,600
At State Route 64	12.39	1,300	1,800	2,050	3,350
Below the confluence of Stream MC-1	11.80	1,050	1,500	1,700	3,450
At State Route 243	11.27	700	1,000	1,350*	3,500
Below Mill Creek Dam	10.60	100	120	1,400	3,550
DRY CREEK					
At the confluence with Mill Creek	7.57	4,700	7,000	8,000	10,250
At State Route 19	7.33	4,750	7,100	8,150	10,550
Below the confluence of Stream DC-1	7.03	4,800	7,250	8,350	10,900
Above the confluence of Stream DC-1	5.59	3,900	5,750	6,600	8,600
Below the confluence of Stream DC-2	5.40	4,150	5,900	6,750	8,700
Above the confluence of Stream DC-2	4.32	3,300	4,650	5,300	6,900
Below the confluence of Stream DC-3	3.90	3,800	5,200	5,800	7,200
At the confluence of Stream DC-3	3.00	2,800*	3,800*	4,300*	5,300*
Above the confluence of Stream DC-3	2.05	1,800	2,500	2,800	3,500
At State Route 243	1.89	1,850	2,550	2,850	3,450

*Interpolated

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TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
STREAM DC-1					
At the confluence with Dry Creek	1.44	1,750	2,400	2,650	3,300
Below First Right Bank Tributary	1.32	1,700	2,300	2,550	3,100
Above First Right Bank Tributary	1.24	1,600	2,200	2,450	2,950
STREAM DC-2					
At the confluence with Dry Creek	1.08	900	1,600	1,900	2,500
Above City Lake Dam	0.86	1,250	1,700	1,900	2,300
Above the confluence of Stream DC-2A	0.68	1,000	1,350	1,500	1,800
STREAM DC-2A					
At the confluence with Stream DC-2	0.18	350	470	520	630
STREAM DC-3					
At the confluence with Dry Creek	1.85	2,150	2,900	3,300	4,000
Below the confluence of Stream DC-3A	1.69	2,050	2,800	3,150	3,800
Above the confluence of Stream DC-3A	1.23	1,500	2,050	2,300	2,800
STREAM DC-3A					
At the confluence with Stream DC-3	0.46	610	830	930	1,130

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross sections for the backwater analysis were field surveyed and were located at close intervals above or below bridges and culverts in order to compute the significant backwater effects of these structures.

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Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and flood plain areas. The following tabulation shows the channel and overbank "n" values for the streams studied by detailed methods; these "n" values do not reflect the values used at the structures:

Stream	Channel "n"	Overbank "n"
Mill Creek	0.060	0.080
Dry Creek	0.040-0.070	0.060-0.095
Stream DC-1	0.050-0.060	0.085-0.090
Stream DC-2	0.055-0.060	0.080-0.085
Stream DC-2A	0.060	0.080-0.085
Stream DC-3	0.060-0.070	0.085-0.095
Stream DC-3A	0.060-0.070	0.080-0.095

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 7). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

The starting water-surface elevations for Mill Creek, Stream DC-1, Stream DC-2, Stream DC-2A, Stream DC-3, and Stream DC-3A were calculated using the slope/area method. Lake Canton Dam on Mill Creek causes the discharges on Mill Creek above the confluence of Dry Creek to be drastically less than the discharges below the confluence of Dry Creek. Because of this, the backwater model on Mill Creek was stopped just upstream of the confluence of Dry Creek; another backwater model from the confluence of Dry Creek to the Lake Canton dam was developed. The water-surface elevations shown on the Mill Creek water-surface profiles are the ponding elevations caused by Dry Branch. The starting water-surface elevations used for Dry Creek were the elevations taken from Mill Creek.

For the streams studied by approximate methods, the flood boundaries were determined using typical depths and widths from streams and known flood depths and widths from past flood experience where the data were available. The flood plain boundary for Lake Canton was determined using the emergency spillway elevation of the dam for the 100-year water-surface elevation of the lake.

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All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages State and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps (References 8 and 9).

For the areas studied by approximate methods, the 100-year flood plain boundaries were delineated using topographic maps and the Flood Hazard Boundary Map for the City of Canton (References 8, 9, and 10).

The 100- and 500-year flood plain boundaries are shown on the Flood Boundary and Floodway Map (Exhibit 2). In cases where the 100- and 500-year flood plain boundaries are close together, only the 100-year flood plain boundary has been shown. Small areas within the flood plain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on flood plains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood plain is

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divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and 100-year flood plain boundaries are either close together or collinear, only the floodway boundary has been shown. Portions of the floodway widths for Stream DC-1 and Stream DC-2 extend beyond the corporate limits.

The area between the floodway and 100-year flood plain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 2 for certain downstream cross sections of Stream DC-3A are lower than the regulatory flood elevations in that area, which must take into account the 100-year flooding due to backwater from other sources.

5.0 INSURANCE APPLICATION

To establish actuarial insurance rates, data from the engineering study must be transformed into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source studied in detail in the City of Canton.

5.1 Reach Determinations

Reaches are defined as sections of flood plain that have relatively the same flood hazard, based on the average weighted difference in water-

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Mill Creek								
A	7,660[1]	250	1,076	1.9	460.7	460.7	461.4	0.7
B	8,455[1]	301	1,037	2.0	461.8	461.8	462.6	0.8
C	9,435[1]	300	865	1.8	463.7	463.7	464.3	0.6
D	12,220[1]	330	901	1.5	468.9	468.9	469.6	0.7
E	13,050[1]	220	652	2.1	469.7	469.7	470.5	0.8
F	14,100[1]	60	345	4.1	471.7	471.7	472.2	0.5
Dry Creek								
A	3,250[2]	400	3,874	2.1	463.3	463.3	463.9	0.6
B	4,140[2]	450	3,316	2.5	463.7	463.7	464.4	0.7
C	5,340[2]	900	4,447	1.9	465.0	465.0	465.9	0.9
D	6,010[2]	600	2,540	2.6	465.8	465.8	466.7	0.9
E	8,400[2]	349	2,029	3.3	474.4	474.4	475.3	0.9
F	9,630[2]	400	3,226	2.1	481.5	481.5	482.1	0.6
G	11,140[2]	500	2,856	1.9	482.2	482.2	483.1	0.9
H	12,680[2]	499	2,464	2.2	485.6	485.6	486.3	0.7
I	13,590[2]	350	2,135	2.6	487.1	487.1	487.8	0.7
J	14,500[2]	301	1,555	2.8	489.1	489.1	489.8	0.7
K	16,500[2]	150	829	3.4	494.7	494.7	495.1	0.4
L	17,190[2]	223	741	3.8	496.7	496.7	497.5	0.8
M	17,740[2]	250	2,605	1.1	507.2	507.2	507.4	0.2
N	18,700[2]	120	996	2.8	507.3	507.3	507.7	0.4
O	19,720[2]	150	768	3.7	510.8	510.8	511.5	0.7

[1]Feet above confluence of Dry Creek

[2]Feet above confluence with Mill Creek

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX
(VAN ZANDT CO.)

FLOODWAY DATA

MILL CREEK - DRY CREEK

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Stream DC-1								
A	1,410[1]	450	1,500	1.7	466.0	466.0	466.8	0.8
B	2,340[1]	200/40[3]	675	3.8	472.3	472.3	473.0	0.7
C	4,510[1]	250/100[3]	635	3.9	482.2	482.2	482.4	0.2
D	5,500[1]	200	821	3.0	486.1	486.1	486.8	0.7
Stream DC-2								
A	1,090[1]	650	7,901	0.2	492.7	492.7	492.9	0.2
B	1,610[1]	700	7,937	0.2	492.7	492.7	492.9	0.2
C	2,450[1]	590	5,289	0.4	492.7	492.7	492.9	0.2
D	2,930[1]	400/190[3]	2,447	0.6	492.7	492.7	492.9	0.2
Stream DC-3								
A	720[1]	150	1,002	4.2	492.2	492.2	492.4	0.2
B	1,520[1]	149	959	4.4	495.2	495.2	495.5	0.3
C	2,520[1]	140	1,023	4.2	498.5	498.5	498.9	0.4
D	4,160[1]	190	1,304	2.3	504.5	504.5	505.2	0.7
Stream DC-3A								
A	540[2]	120	458	2.0	502.3	499.5[4]	500.3	0.8
B	880[2]	82	316	2.9	502.3	501.9[4]	502.5	0.6
C	1,430[2]	170	160	5.8	509.2	509.2	509.6	0.4
D	2,270[2]	98	247	3.8	510.4	510.4	510.7	0.3

[1]Feet above confluence with Dry Creek

[2]Feet above confluence with Stream DC-3

[3]Width/width within corporate limits

[4]Elevation computed without consideration of backwater from Stream DC-3

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX

(VAN ZANDT CO.)

FLOODWAY DATA

STREAM DC-1 · STREAM DC-2 · STREAM DC-3 · STREAM DC-3A

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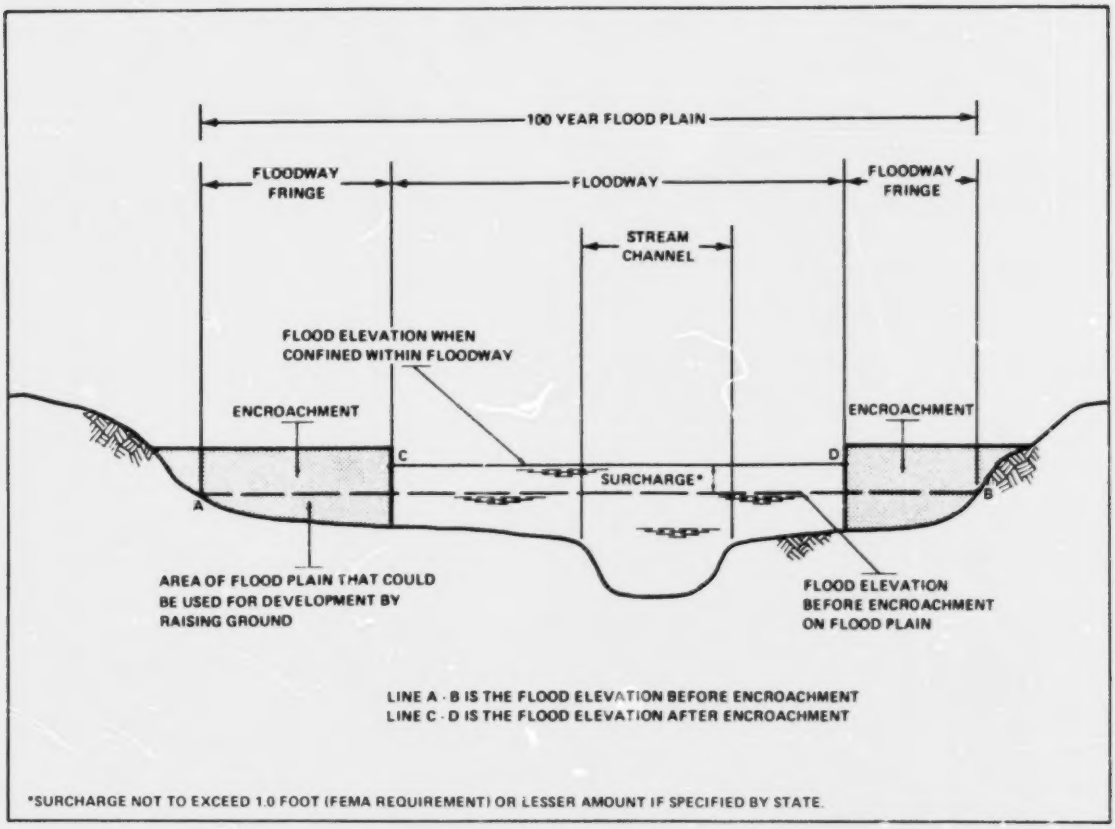
100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC

Figure 2

surface elevations between the 10- and 100-year floods. This difference may not have a variation greater than that indicated in the following tabulation for more than 20 percent of the reach:

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of the City of Canton are shown on the Flood Profiles (Exhibit 1) and summarized in Table 3.

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is used to establish relationships between depth and frequency of flooding in any reach. This relationship is then

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Mill Creek							
Reach 1	03,04	-1.0	-0.4	+1.3	10	A2	Varies
Dry Creek							
Reach 1	03	-2.1	-0.7	+1.5	20	A4	Varies
Reach 2	03	-1.3	-0.5	+0.6	15	A3	Varies
Reach 3	03	-5.4	-3.6	+0.3	55	A11	Varies
Reach 4	03,04	-1.3	-0.6	+0.4	15	A3	Varies
Stream DC-1							
Reach 1	03	-0.5	-0.2	+0.3	05	A1	Varies
Stream DC-2							
Reach 1	03	-1.0	-0.2	+0.4	10	A2	Varies
Stream DC-3							
Reach 1	03	-1.1	-0.3	+0.5	10	A2	Varies
Stream DC-3A							
Reach 1	03	-4.4	-1.4	+1.1	45	A9	Varies
Reach 2	03	-0.7	-0.2	+0.7	05	A1	Varies

[1]Flood Insurance Rate Map Panel
[2]Weighted Average
[3]Rounded to the nearest foot - see map

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX
(VAN ZANDT CO.)

FLOOD INSURANCE ZONE DATA

MILL CREEK · DRY CREEK · STREAM DC-1 · STREAM DC-2 · STREAM DC-3 · STREAM DC-3A

used with depth-damage relationships for various classes of structures to establish actuarial insurance rate tables.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations rounded to the nearest one-half foot, multiplied by 10, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year flood water-surface elevations is greater than 10.0 feet, it is rounded to the nearest whole foot.

5.3 Flood Insurance Zones

Flood insurance zones and zone numbers are assigned based on the type of flood hazard and the FHF, respectively. A unique zone number is associated with each possible FHF, and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 or greater.

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zones A1, A2, A3, A4, A9, and A11:	Special Flood Hazard Areas inundated by the 100-year flood; with base flood elevations shown, and zones subdivided according to FHFs.
Zone B:	Areas between the Special Flood Hazard Areas and the limits of the 500-year flood; areas that are protected from the 100- or 500-year floods by dike, levee, or other water control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding; not subdivided.

Flood elevation differences, FHFs, flood insurance zones, and base flood elevations for the flooding sources studied in detail in the community are shown in Table 3.

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5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the City of Canton is, for insurance purposes, the principal result of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and base flood elevations. Base flood elevation lines show the locations of the expected whole-foot water-surface elevation of the base (100-year) flood. The base flood elevations and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the National Flood Insurance Program.

6.0 OTHER STUDIES

Due to the more detailed analyses, this Flood Insurance Study supersedes the previous Flood Hazard Boundary Map for the City of Canton (Reference 10).

7.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, Federal Emergency Management Agency, Regional Director, Region VI Office, Federal Center, 800 North Loop 288, Denton, Texas 76201.

8.0 BIBLIOGRAPHY AND REFERENCES

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10. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, City of Canton, Van Zandt County, Texas, January 30, 1976.

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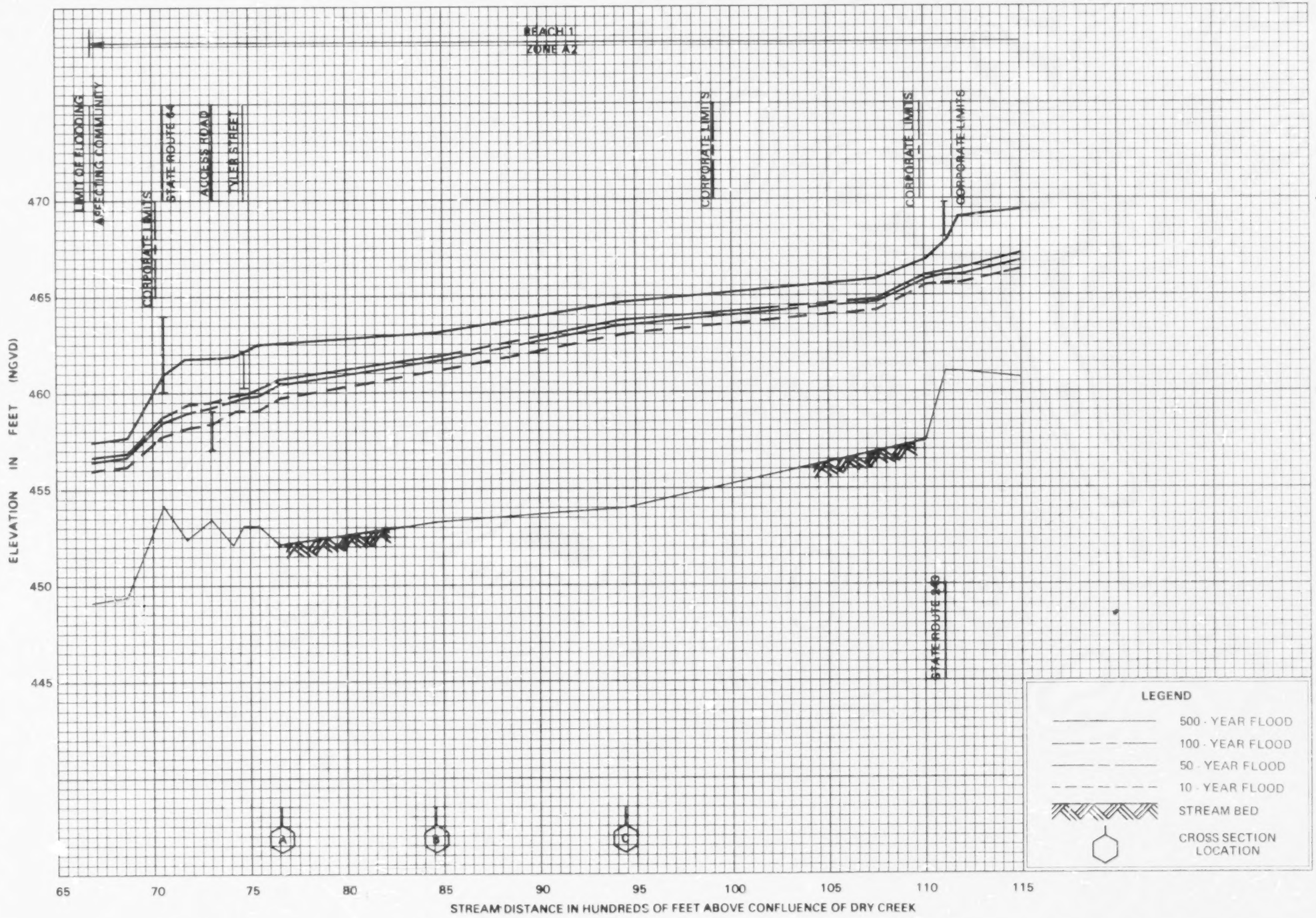

FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX
(VAN ZANDT CO.)

01P

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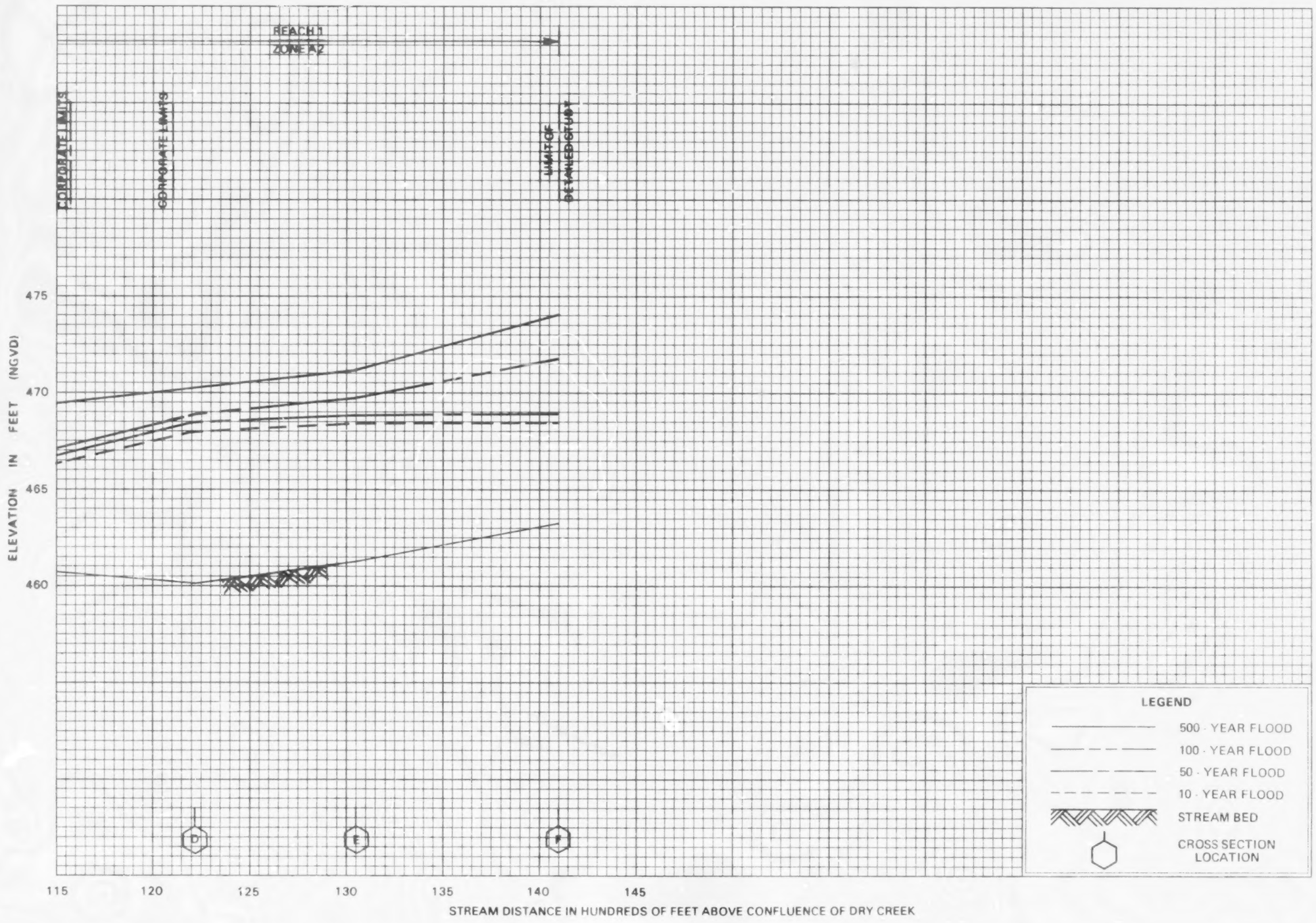

FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX
(VAN ZANDT CO.)

02P

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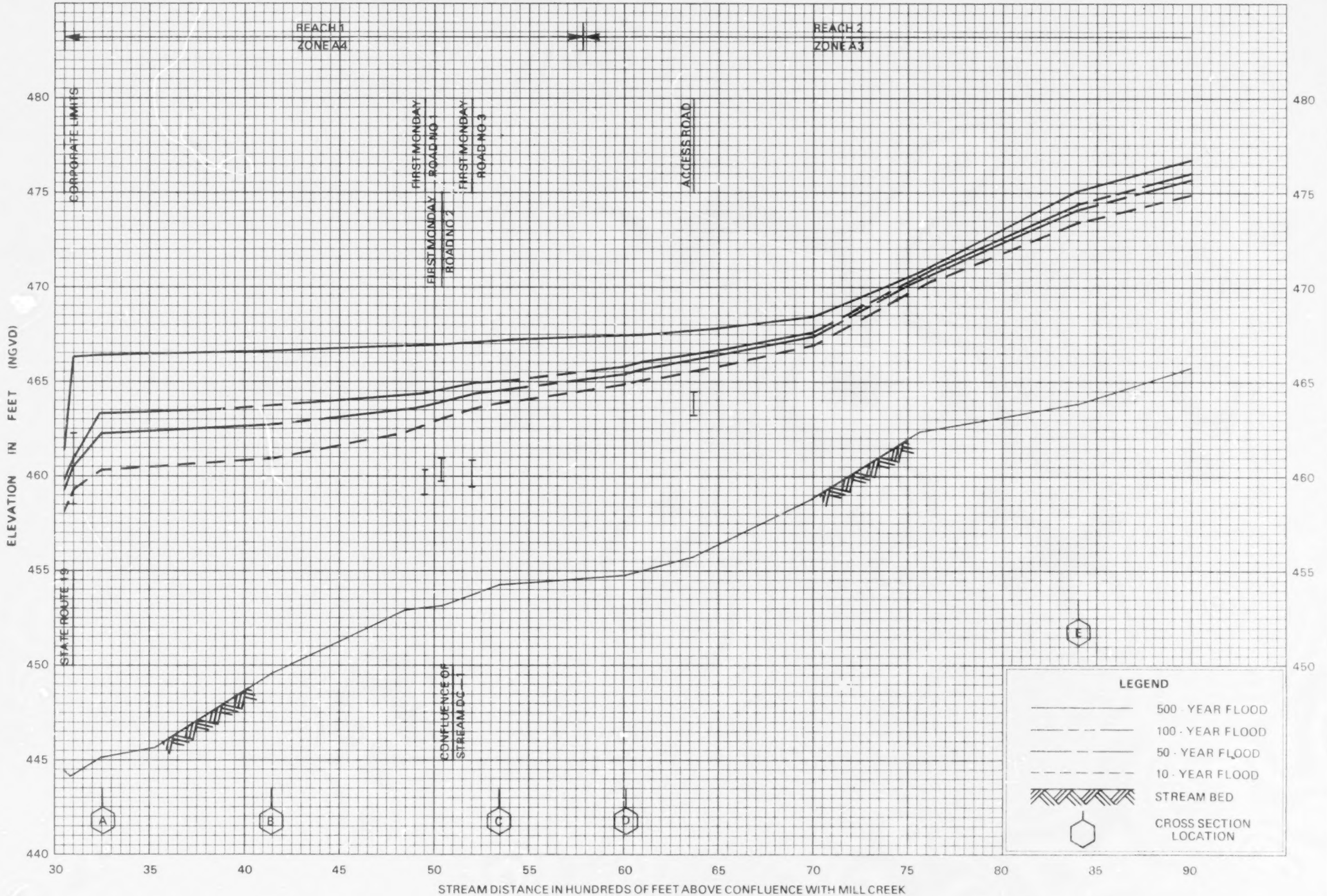

FLOOD PROFILES

DRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX
(VAN ZANDT CO.)

03P

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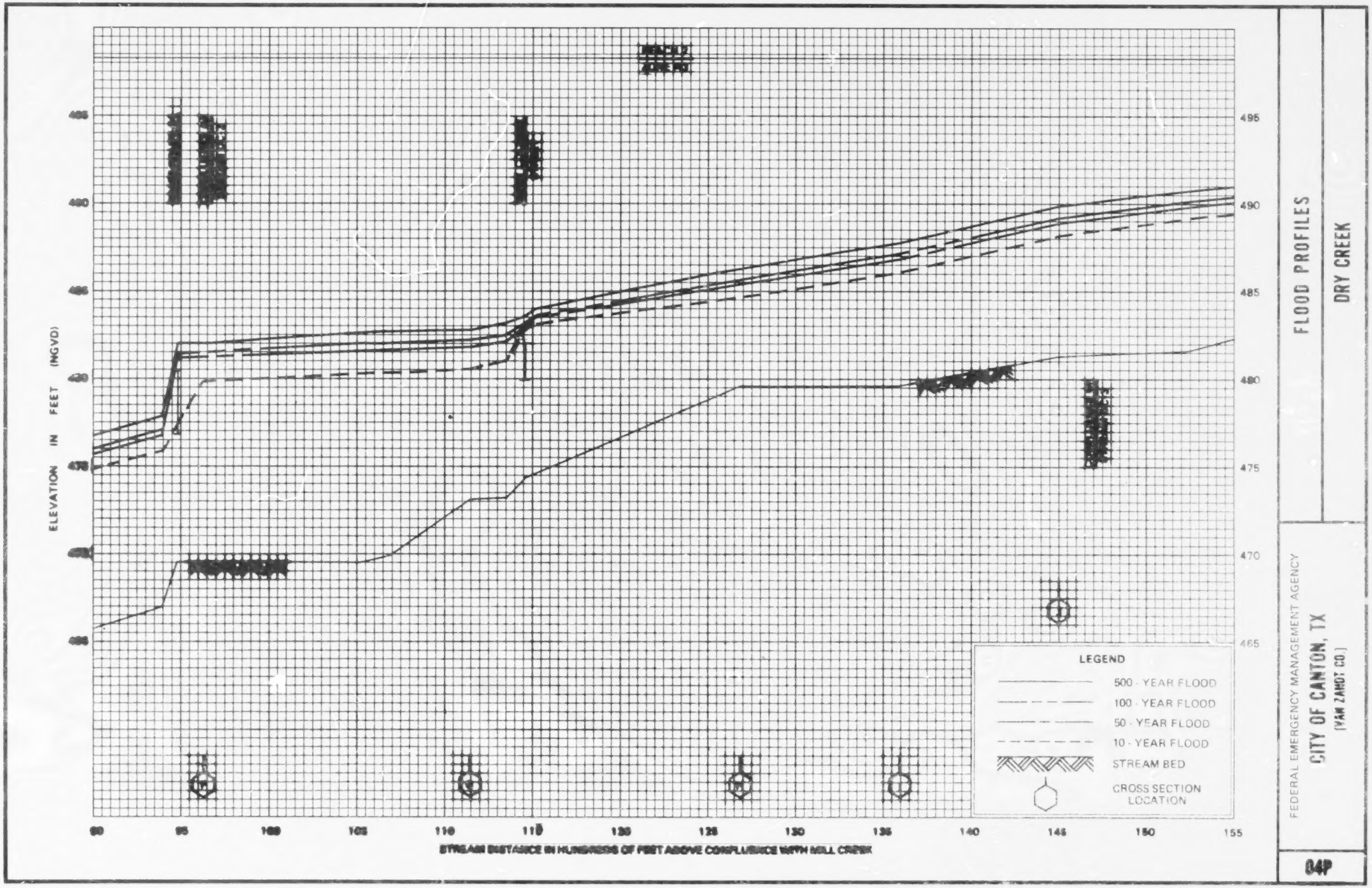

FLOOD PROFILES

DRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX

(VAN ZANDT CO.)

04P

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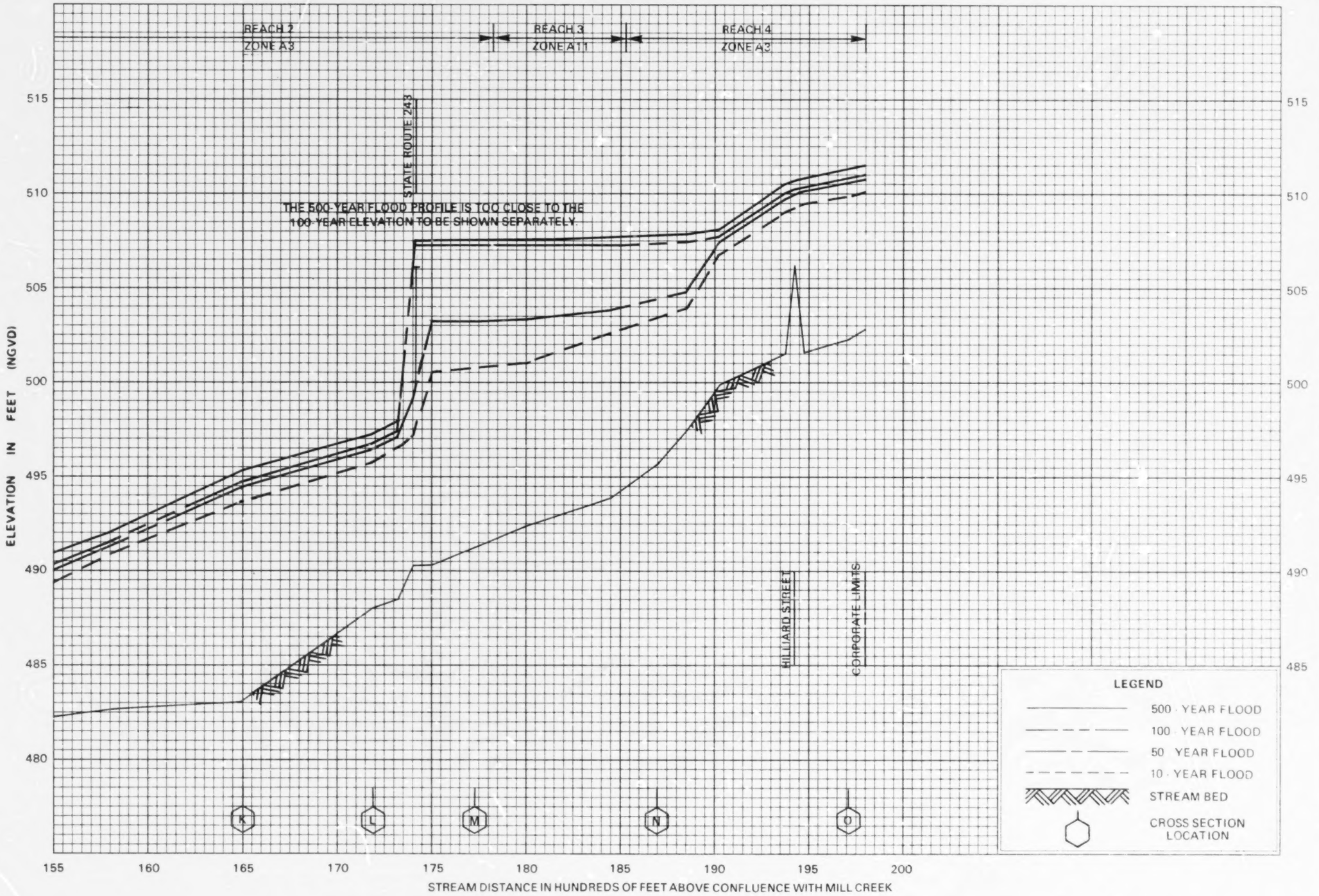

FLOOD PROFILES

DRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX
(VAN ZANDT CO.)

05P

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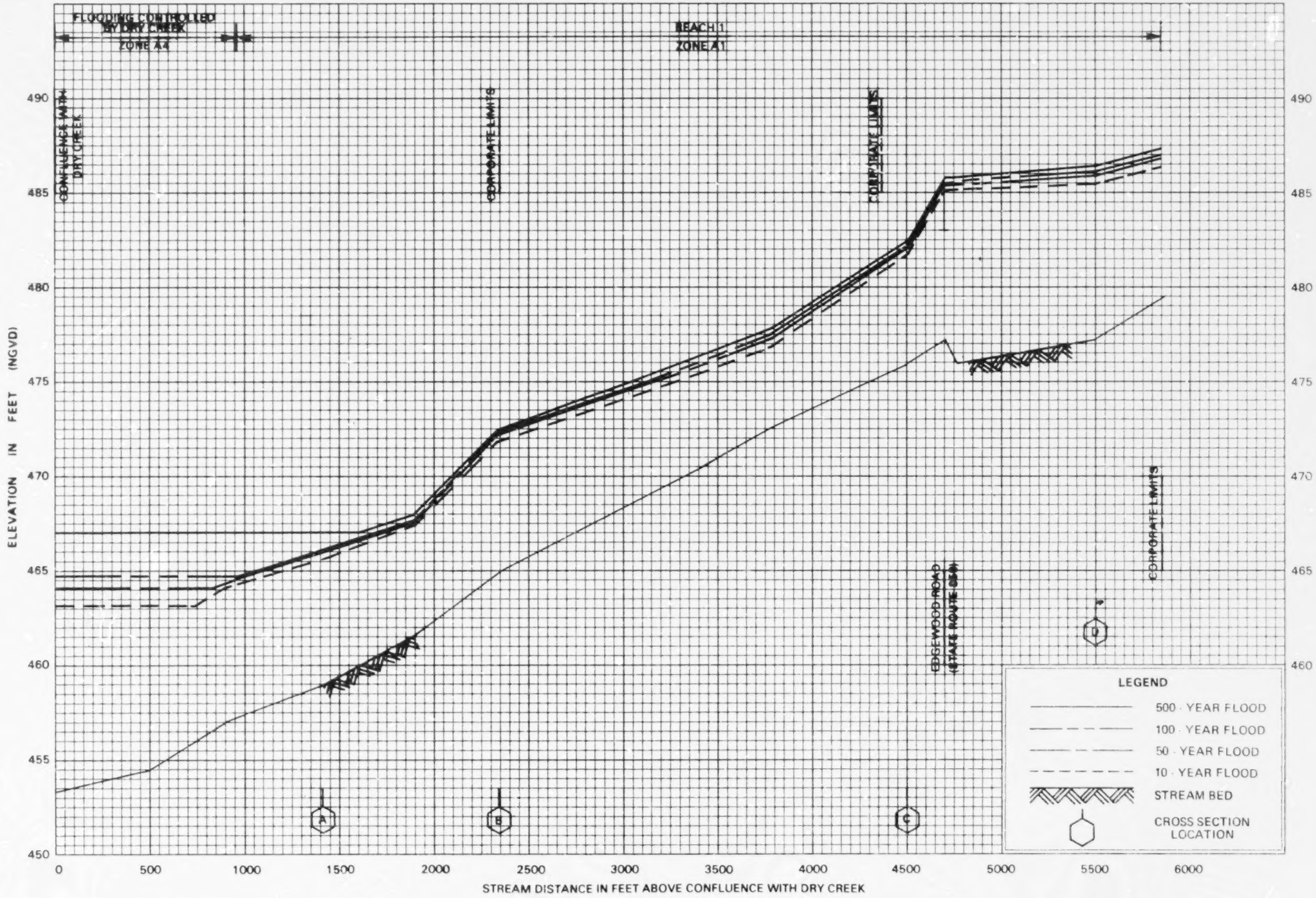

FLOOD PROFILES

STREAM DC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX
(VAN ZANDT CO.)

06P

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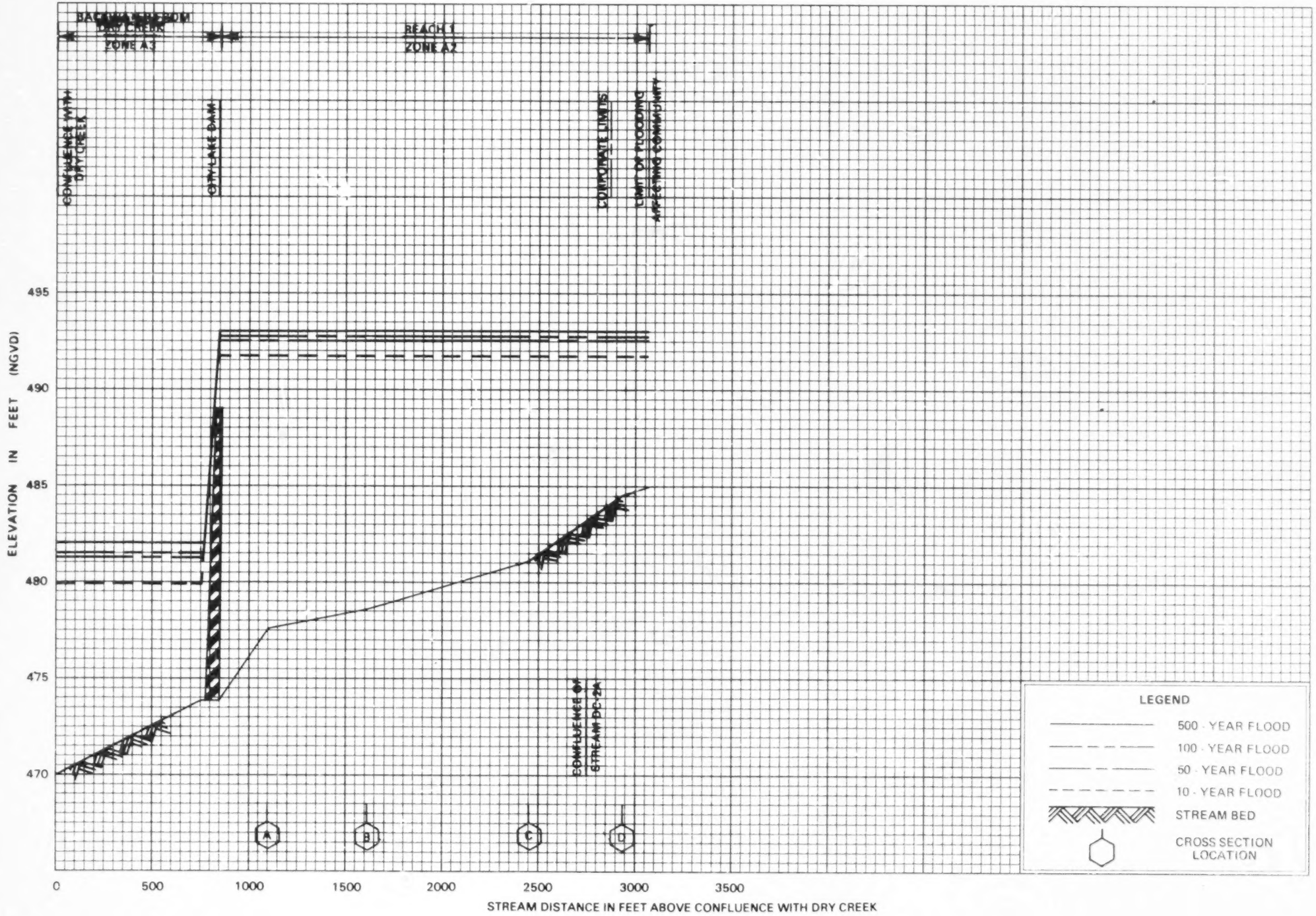

FLOOD PROFILES

STREAM DC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX
(VAN ZANDT CO.)

07P

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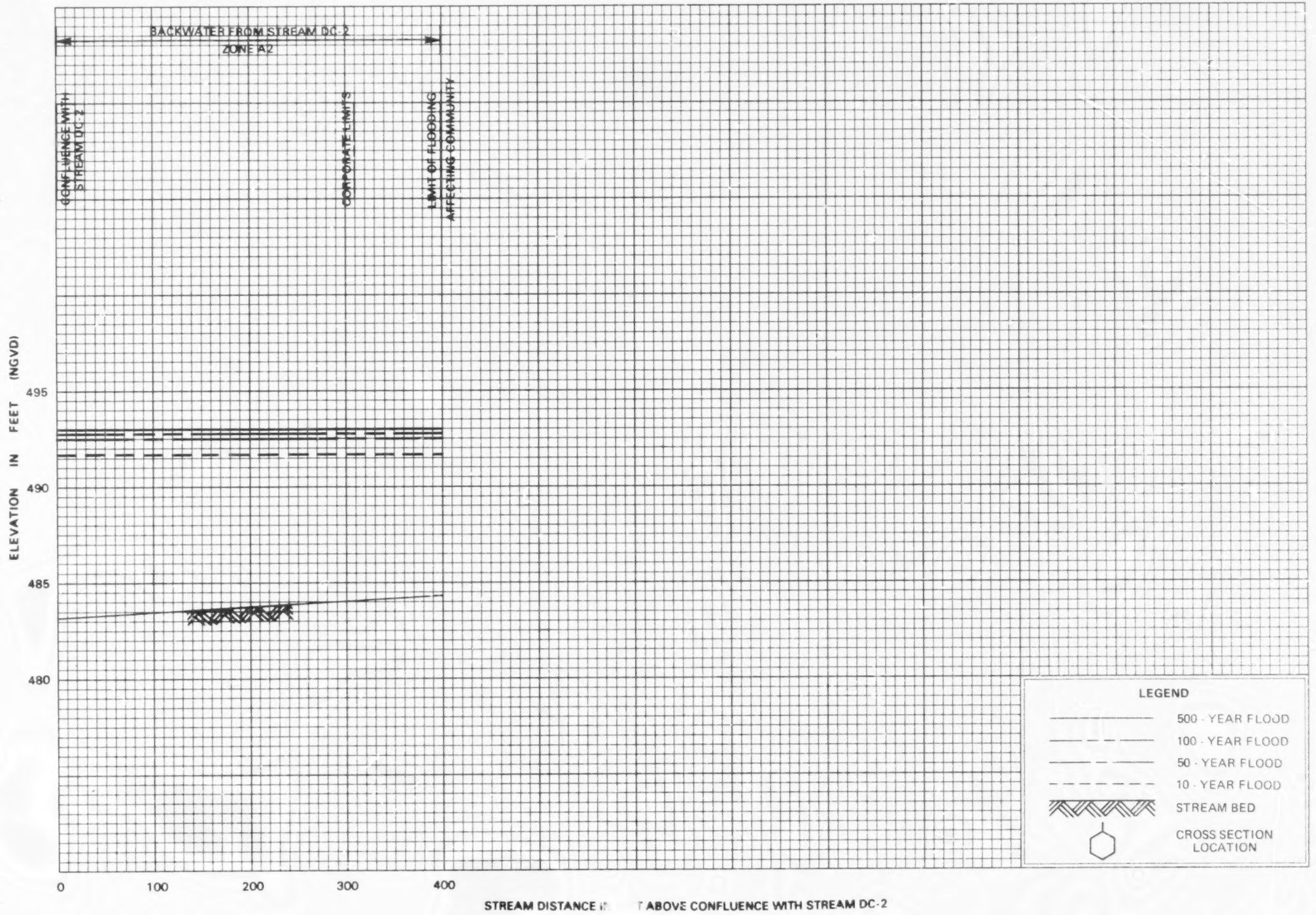

FLOOD PROFILES

STREAM DC-2A

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX

(VAN ZANDT CO.)

08P

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FLOOD PROFILES

STREAM DC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX

(VAN ZANDT CO.)

09P

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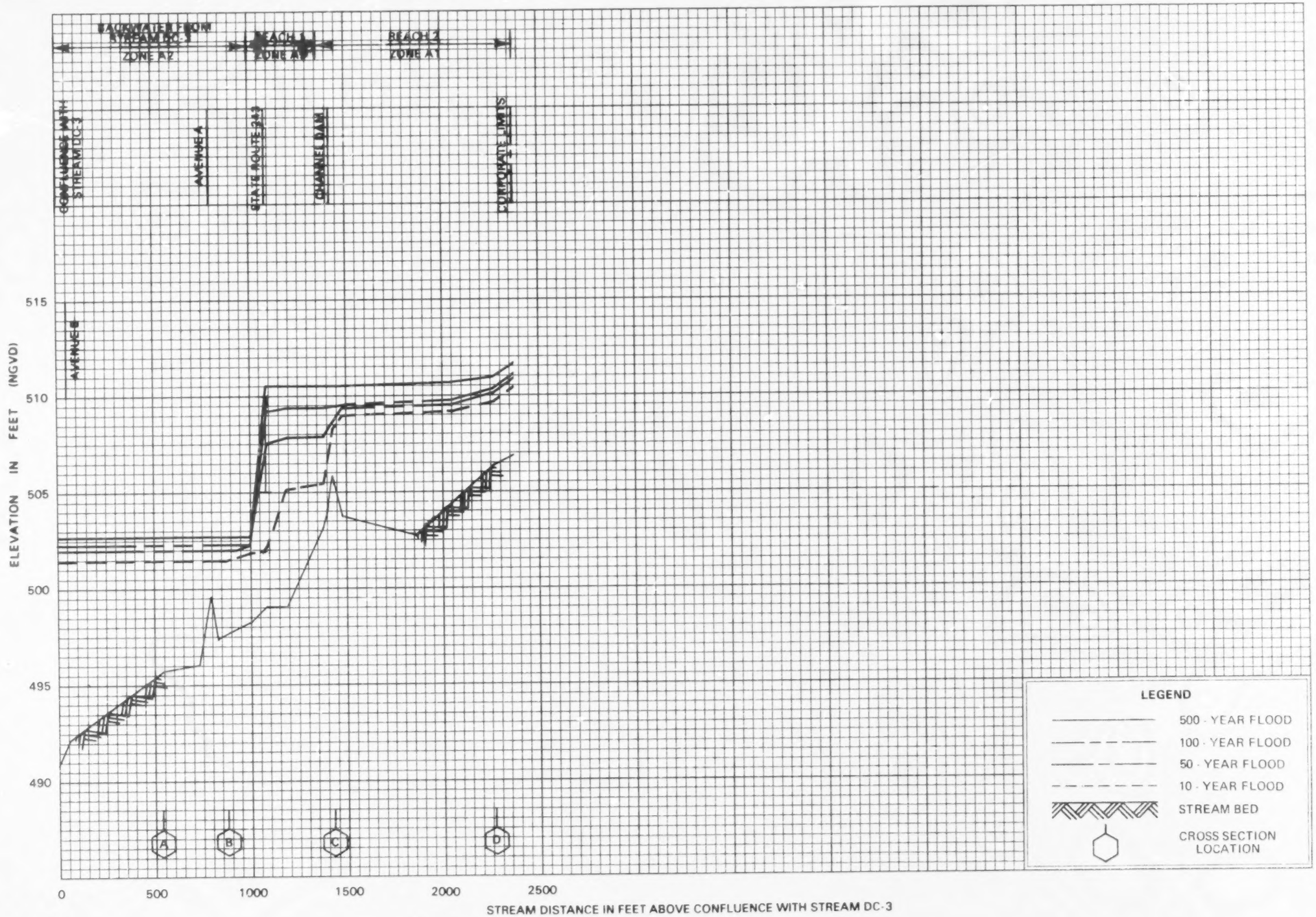

FLOOD PROFILES

STREAM DC-3A

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CANTON, TX
(VAN ZANDT CO.)

10P

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